

### AMENDMENTS TO THE CLAIMS

Please amend the claims as set forth below.

What is claimed is:

1. (Currently Amended). A method for optimizing a refractive prescription without using subjective refractions, the method comprising the steps of:
  - a. obtaining aberrometric data from a patient by way of an aberrometer; and
  - b. selecting an objective image quality metric, wherein the objective metric of image quality is selected from a group consisting of average blur strength ("B<sub>ave</sub>"), pupil fraction when the critical pupil is defined as the concentric area for which RMS<sub>w</sub> is less than a criterion ("PFW<sub>c</sub>"), pupil fraction when the critical pupil is defined as the concentric area for which RMS<sub>s</sub> is less than the criterion ("PFS<sub>c</sub>"), pupil fraction when the critical pupil is defined as the concentric area for which B<sub>ave</sub> is less than the criterion ("PFC<sub>c</sub>"), area of a good subaperture divided by the total area of a pupil when the good subaperture satisfies a criterion  $PV < \text{the criterion ("PFW}_t\text{")}$ , area of the good subaperture divided by the total area of a pupil when the good subaperture satisfies a criterion horizontal slope and vertical slope are both less than the criterion ("PFS<sub>t</sub>"), area of the good subaperture divided by a total area of a pupil when the good subaperture satisfies the criterion B less than the criterion ("PFC<sub>t</sub>"), visual strehl ratio computed in a spatial domain ("VSX"), visual strehl ratio computed in a frequency domain by modulation transfer function method ("VSMTF"), visual strehl ratio computed in the frequency domain by optical-transfer function method ("VSOTF"), volume under optical transfer function normalized by a volume under modulation-transfer function ("VOTF"), volume under neurally-weighted optical transfer function normalized by the volume under neurally-weighted modulation-transfer function ("VNOTF");

- c. computing the objective image quality metric from the aberrometric data;
- d. iteratively modifying the level of spherical and cylindrical defocus of the  
abberometric data;
- e. computing the modified objective image quality metric from the modified  
abberometric data;
- f. repeating steps c and d until the modified objective image quality metric is  
optimized; and
- g. generating at least one clinical refractive sphereocylindrical prescription  
for the patient based on the optimized objective image quality metric.

~~utilizing the aberrometric data to perform an equivalent quadratic fitting calculation that optimizes the quality of the retinal image to obtain at least one clinical refractive sphereocylindrical prescription for the patient, whereby the method for optimizing a refractive prescription occurs without the use of subjective refractions.~~

2. (Original) The method of claim 1, further comprising the step of adjusting the refractive prescription to maximize the utilization of the patient's depth of field if the aberrometric data suggests that the patient's vision is myopic.

3. (Original) The method of claim 1, further comprising the step of adjusting the ideal optic prescription to maximize the utilization of the patient's depth of field if the aberrometric data suggests that the patient's vision is hyperopic.

4. (Cancelled).

5. (Original) The method of claim 1, further comprising the step of evaluating the results and allowing a user to determine whether the prescription should be further optimized.

6. (Original) The method of claim 1, further comprising the step of selecting one of a plurality of optic prescriptions.

7. (Original) The method of claim 1, further comprising the steps of:

- a. obtaining patient data; and
- b. utilizing the patient data to optimize a clinical refractive prescription.

8. (Previously Amended) The method of claim 1, further comprising the steps of:

- a. obtaining environmental data; and
- b. utilizing the environmental data to optimize a clinical refractive prescription.

9. (Currently Amended) A method for optimizing a refractive prescription without using subjective refractions, the method comprising the steps of:

- a. obtaining aberrometric data from a patient by way of an aberrometer;
- b. selecting a metric of optimized image quality, wherein the metric of image quality if selected from a group consisting of average blur strength ("B<sub>ave</sub>"), pupil fraction when the critical pupil is defined as the concentric area for which RMS<sub>w</sub> is less than a criterion ("PFW<sub>c</sub>"), pupil fraction when the critical pupil is defined as the concentric area for which RMS<sub>s</sub> is less than the criterion ("PFS<sub>c</sub>"), pupil fraction when the critical pupil is defined as the concentric area for which B<sub>ave</sub> is less than the criterion ("PFC<sub>c</sub>"), area of a good subaperture divided by the total area of a pupil when the good subaperture satisfies a criterion PV < the criterion ("PFW<sub>t</sub>"), area of the good subaperture divided by the total area of a pupil when the good subaperture satisfies a criterion horizontal slope and vertical slope are both less than the criterion ("PFS<sub>t</sub>"), area of the good subaperture divided by a total area of a pupil when the good subaperture satisfies the criterion B less than the criterion ("PFC<sub>t</sub>"), visual strehl ratio computed in a spatial domain ("VSX"), visual strehl ratio computed in a frequency domain by modulation

transfer function method ("VSMTF"), visual strehl ratio computed in the frequency domain by optical-transfer function method ("VSOTF"), volume under optical transfer function normalized by a volume under modulation-transfer function ("VOTF"), volume under neurally-weighted optical transfer function normalized by the volume under neurally-weighted modulation-transfer function ("VNOTF");

c. generating an aberration map from the aberrometric data; and  
d. simulating a through focus experiment; and  
e. computing an ideal optic prescription using the metric of optimized image quality; whereby the method for optimizing a refractive prescription occurs without the use of subjective refractions.

10. (Original) The method of claim 9, further comprising the step of adjusting the ideal optic prescription to maximize the utilization of the eye's depth of field if the aberrometric data suggests that the patient's vision is myopic.

11. (Original) The method of claim 9, further comprising the step of adjusting the ideal optic prescription to maximize the utilization of the eye's depth of field if the aberrometric data suggests that the patient's vision is hyperopic.

12. (Original) The method of claim 9, wherein the step of simulating a through focus experiment is performed by a computer processor.

13. (Original) The method of claim 9, further comprising the step of evaluating the results and allowing a user to determine whether the prescription should be further optimized.

14. (Original) The method of claim 9, further comprising the steps of:

- a. obtaining patient data; and
- b. utilizing the patient data to optimize a clinical refractive prescription.

15. (Previously Amended) The method of claim 9, further comprising the steps of:
  - a. obtaining environmental data; and
  - b. utilizing the environmental data to optimize a clinical refractive prescription.
16. (Original) The method of claim 9, comprising the additional step of recalculating metrics for each condition in the through focus simulation.
17. (Original) The method of claim 16, further comprising the step of selecting a prescription that maximizes the chosen metric.
18. (Original) The method of claim 17, wherein the prescription that maximizes the chosen metric is maximized for a specific distance.
19. (Original) The method of claim 17, wherein the prescription that maximizes the chosen metric is maximized to achieve a desired trade-off between maximal quality and depth of focus.
20. (Previously Presented) The method of claim 1, wherein the equivalent quadratic fitting calculation nulls the second-order Zernike coefficients in the aberrometric map.
21. (Previously Presented) The method of claim 1, wherein the equivalent quadratic fitting calculation nulls the second-order Seidel coefficients in the aberrometric map.
22. (Previously Presented) The method of claim 9, further comprising the step of eliminating at least one spherical and cylindrical refractive error by nulling the second-order Zernike coefficients in the aberrometric map.
23. (Previously Presented) The method of claim 9, further comprising the step of eliminating at least one spherical and cylindrical refractive error by nulling the second-order Seidel coefficients in the aberrometric map.
24. (Cancelled)

25. (New) A method for optimizing a refractive prescription without using subjective refractions, the method comprising the steps of:

- a. obtaining aberrometric data from a patient by way of an aberrometer;
- b. selecting a metric of optimized image quality, wherein the metric is selected from a group consisting of average blur strength (" $B_{ave}$ "), pupil fraction when the critical pupil is defined as the concentric area for which  $RMS_w$  is less than a criterion (" $PFW_c$ "), pupil fraction when the critical pupil is defined as the concentric area for which  $RMS_s$  is less than the criterion (" $PFS_c$ "), pupil fraction when the critical pupil is defined as the concentric area for which  $B_{ave}$  is less than the criterion (" $PFC_c$ "), area of a good subaperture divided by the total area of a pupil when the good subaperture satisfies a criterion  $PV < \text{the criterion}$  (" $PFW_t$ "), area of the good subaperture divided by the total area of a pupil when the good subaperture satisfies a criterion horizontal slope and vertical slope are both less than the criterion (" $PFS_t$ "), area of the good subaperture divided by a total area of a pupil when the good subaperture satisfies the criterion B less than the criterion (" $PFC_t$ "), visual strehl ratio computed in a spatial domain (" $VSX$ "), visual strehl ratio computed in a frequency domain by modulation transfer function method (" $VSMTF$ "), visual strehl ratio computed in the frequency domain by optical-transfer function method (" $VSOTF$ "), volume under optical transfer function normalized by a volume under modulation-transfer function (" $VOTF$ "), volume under neurally-weighted optical transfer function normalized by the volume under neurally-weighted modulation-transfer function (" $VNOTF$ ");
- c. generating an aberration map from the aberrometric data;
- d. simulating a through focus experiment; whereby the method for optimizing a refractive prescription occurs without the use of subjective refractions;

- e. calculating metrics for each condition in the through focus simulation; and
  - f. selecting a prescription that maximizes the chosen metric.
26. (New) The method of claim 25, further comprising the steps of:
- adjusting at least one variable of the aberrometric data; and
  - recalculating the metrics for each condition in the through focus simulation.